AMENDATORY SECTION (Amending Order 01-10, filed 1/3/06, effective 2/3/06)

WAC 173-218-030 Definitions. **"Abandoned well"** means a well that is unused, unmaintained, or is in such disrepair as to be unusable.

"AKART" is an acronym that means all known, available and reasonable methods of prevention, control and treatment. AKART shall represent the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants associated with a discharge. The concept of AKART applies to both point and nonpoint sources of pollution. The term "best management practices" typically applies to nonpoint source pollution controls, and is considered a subset of the AKART requirement. The storm water management manuals (see definition in this section) may be used as a guideline, to the extent appropriate, for developing best management practices to apply AKART for storm water discharges.

"Aquifer" means a geologic formation, group of formations or part of a formation capable of yielding a significant amount of ground water to wells or springs.

"Beneficial uses" mean uses of the waters of the state which include, but are not limited to, use for domestic, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state.

"Best management practices" mean approved physical, structural, and/or managerial practices that, when used singularly or in combination, prevent or reduce pollutant discharges.

"Caprock" means geologic confining layer(s) that has sufficiently low permeability and lateral continuity to prevent the migration of injected carbon dioxide out of the geologic containment system.

"Cesspool" means a drywell that receives untreated sanitary waste containing human excreta, and that sometimes has an open bottom and/or perforated sides that discharge to the subsurface.

"Commercial business" means a type of business activity that may distribute goods or provide services, but does not involve the manufacturing, processing or production of goods.

"Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally in ground water or that occurs at concentrations greater than those found naturally.

"Contamination" means introduction of a contaminant.

"Dangerous waste" means those solid wastes designated in WAC 173-303-070 through 173-303-100 as dangerous, or extremely

hazardous or mixed waste. As used in chapter 173-303 WAC, Dangerous waste regulations, the words "dangerous waste" will refer to the full universe of wastes regulated by chapter 173-303 WAC.

"Decommission" means to fill or plug a UIC well so that it will not result in an environmental or public health or safety hazard, nor serve as a channel for movement of water or pollution to an aquifer.

"Department" means department of ecology.

"Dispersion" means the release of surface and storm water runoff from a drainage facility system such that the flow spreads over a wide area and is located so as not to allow flow to concentrate anywhere upstream of a drainage channel with erodible underlying granular soils.

"Drywell" means a well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so that its bottom and sides are typically dry except when receiving fluids.

"Existing well" means a well that is in use at the adoption date of this chapter.

"Fluid" means any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state.

"Geologic containment system" means the geologic layers that both receive the injected carbon dioxide (CO_2) and contains or sequesters it within the system's physical boundaries. The containment system is a three-dimensional area with defined boundaries, that includes one or more geologic formations.

"Geologic sequestration of carbon dioxide" means the injection of carbon dioxide, usually from human activities like burning coal or oil, into subsurface geologic formations to prevent its release into the atmosphere for a defined length of time.

"Geologic sequestration project" means the surface and underground facilities used to inject carbon dioxide for sequestration and includes: Geologic containment system, monitoring zone(s) and surface facilities described in the permit application.

"Geologic sequestration project boundary" means a three-dimensional boundary defined in permit that encloses all surface and underground facilities of the geologic sequestration project and extending vertically to the overlying ground surface.

"Ground water" means water in a saturated zone or stratum beneath the surface of land or below a surface water body.

"Ground water protection area" means a geographic area that is by or close by a surrounding community and nontransient noncommunity water system, that uses ground water as a source of drinking water (40 CFR 144.87) and other sensitive ground water areas critical to protecting underground sources of drinking water from contamination; such as sole source aquifers, highly productive aquifers supplying private wells, critical aquifer recharge areas and/or other state and local areas determined by state and local governments.

"Hazardous substances" mean any dangerous or extremely

hazardous waste as defined in RCW 70.105.010 (5) and (6) or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous substance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment.

"High threat to ground water" means, for this chapter, a UIC well is a high threat to ground water when it receives fluids that cannot meet the criteria in chapter 173-200 WAC Water quality standards for ground waters of Washington (GWQS) at the top of the aquifer, which include, but are not limited to, the following examples: A UIC well that receives drainage, that has not been pretreated and does not meet the GWQS; such as, from an area where storm water comes into contact with a vehicle fueling area, airport deicing activities, storage of treated lumber or vehicle washing; or a UIC well that receives a discharge that is determined to be an imminent public health hazard by a legal authority or is prohibited in this chapter.

"Improved sinkhole" means a naturally occurring karst depression or other natural crevice found in volcanic terrain and other geologic settings that has been modified by man for the purpose of directing and emplacing fluids into the subsurface.

"Infiltration pond" means an earthen impoundment used for the collection, temporary storage and infiltration of incoming storm water runoff.

"Infiltration trench" means a trench used to infiltrate fluid into the ground, is generally at least twenty-four inches wide and backfilled with a coarse aggregate. Perforated pipe or a product with similar use may also be installed.

"Industrial wastewater" means water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feedlots, poultry houses or dairies. The term includes contaminated storm water and leachate from solid waste facilities.

"Monitoring zone(s)" means the geologic layers, identified in the application, where chemical, physical and other characteristics are measured to establish the location, behavior and effects of the injected carbon dioxide in the subsurface and to detect leakage from the geologic containment system. At a minimum, a monitoring zone must be established beneath the ground surface but outside of the geologic containment system to detect leakage of injected CO_2.

"Motor vehicle waste disposal well" means a Class V injection well that is typically a shallow disposal system that receives or has received fluids from vehicular repair or maintenance activities such as auto body repair shop, automotive repair shop, new and used

car dealership, specialty repair shops or any facility that does any vehicular repair work (40 CFR 144.81).

"New injection well" means an injection well that is put in use following the adoption date of this chapter.

"Nonendangerment standard" means to prevent the movement of fluid containing any contaminant into the ground water if the contaminant may cause a violation of the Water quality standards for ground waters of the state of Washington, chapter 173-200 WAC or may cause health concerns.

"Nonpollution-generating surface" means a surface considered to be an insignificant source of pollutants in storm water runoff and/or a surface not defined as a pollution-generating surface.

"Person" means any political subdivision, local, state, or federal government agency, municipality, industry, public or private corporation, partnership, association, firm, individual, or any other entity whatsoever.

"Point of compliance" means the location where the facility must be in compliance with chapter 173-200 WAC Water quality standards for ground waters of the state of Washington; the top of the aquifer, as near to the source as technically, hydrogeologically, and geographically feasible.

"Pollution" means contamination or other alteration of the physical, chemical, or biological properties of waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the state as will, or is likely to, create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

"Pollution-generating surfaces" mean the surfaces are considered a significant source of pollutants in storm water runoff. Pollution generating surfaces include pollution generating pervious surfaces and pollution generating impervious surfaces such as surfaces that are subject to: Regular vehicular use, industrial activities, or storage of erodible or leachable materials that receive direct rainfall, or the run-on or blow-in of rainfall, use of pesticides or fertilizers or loss of soil; or leaching such as from metal roofs not coated with an inert, nonleachable material, roofs that are subject to venting of manufacturing, commercial, or other indoor pollutants. Examples of commercial indoor pollutants are commercial facilities such as restaurants where oils and other solid particles are expected to be expelled. It does not include normal indoor air venting at commercial facilities where activities such as cooking, processing, etc., do not take place. Examples are: Roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unfenced fire lanes, vehicular equipment storage yards, airport runways, lawns, and landscaped areas that apply pesticide applications; such as golf courses, parks, cemeteries, and sports fields except for landscaped areas that are approved infiltrative best management

practices.

"Proper management of storm water" means AKART has been provided or the well owner has demonstrated that the discharge will meet the nonendangerment standard.

"Radioactive waste" means any waste which contains radioactive material in concentrations that exceed those listed in 10 Code of Federal Regulations Part 20, Appendix B, Table II, and Column 2.

"Retrofit" means taking actions to reduce the pollutant load from a UIC well to meet the statutory requirements of 40 CFR 144.12 and RCW 90.48.010. These actions may include, but are not limited to: Changes to the source control activities and/or structures around the well; an upgrade to the well such as adding a catch basin or spill control device; and/or addition of pretreatment facilities or decommissioning. The selection of actions is based on local priorities, required by the department or the local jurisdiction to address a documented water quality problem.

"Rule authorized" means a UIC well that is registered with the department and meets the nonendangerment standard. If a well is rule authorized, it does not require a state waste discharge permit from the department.

"Sanitary waste" means liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned. Sources of these wastes may include single or multiple residences, hotels and motels, restaurants, bunkhouses, schools, ranger stations, crew quarters, guard stations, campgrounds, picnic grounds, day-use recreation areas, other commercial facilities, and industrial facilities provided the waste is not mixed with industrial waste.

"Septic system" means a well that is used to discharge sanitary waste below the surface and is typically comprised of a septic tank and subsurface fluid distribution system or disposal system. (Also called on-site sewage system.)

"Sequestration" means to set apart or remove.

"State waste discharge permit" means a permit issued in accordance with chapter 173-216 WAC, State waste discharge permit program.

"Storm water" means the portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes and other features of a storm water drainage system into a defined surface water body, or a constructed treatment, evaporation, or infiltration facility.

"Storm water manuals" mean the *Stormwater Management Manual for Eastern or Western Washington* or other manuals approved by the department.

"Storm water pollution prevention plan" means a documented plan to implement measures to identify, prevent, and control the contamination of storm water and its discharge to UIC wells.

"Subsurface fluid distribution system" means an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended

to distribute fluids below the surface of the ground.

"Underground source of drinking water" means ground waters that contain fewer than 10,000 mg/L of total dissolved solids and/or supplies drinking water for human consumption.

"UIC well" or **"underground injection control well"** means a well that is used to discharge fluids into the subsurface. A UIC well is one of the following: (1) A bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension; (2) an improved sinkhole; or (3) a subsurface fluid distribution system.

"Waste fluid" means any fluid that cannot meet the nonendangerment standard at the point of compliance, which is the top of the aquifer.

"Well assessment" means an evaluation of the potential risks to ground water from the use of UIC wells. A well assessment includes information such as the land use around the well which may affect the quality of the discharge and whether the UIC well is located in a ground water protection area. It may include the local geology and depth of the ground water in relation to the UIC well if the well is considered a high threat to ground water.

"Well injection" means the subsurface emplacement of fluids through a well.

"You" means the owner or operator of the UIC well.

AMENDATORY SECTION (Amending Order 01-10, filed 1/3/06, effective 2/3/06)

WAC 173-218-040 UIC well classification including allowed and prohibited wells. The most common type of UIC well in Washington is a Class V well. A Class V well is usually a shallow disposal well such as a drywell, drainfield or French drain (see subsection (5) of this section).

(1) "Class I injection well" means a well used to inject dangerous and/or radioactive waste, beneath the lowermost formation containing an underground source of drinking water within one-quarter mile of the well bore. All Class I wells are prohibited in Washington and must be decommissioned.

(2) "Class II injection well" means a well used to inject fluids:

(a) Brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production. It may be mixed with wastewaters from gas plants that are an integral part of production operations, unless those waters are classified as hazardous wastes at the time of injection;

(b) For enhanced recovery of oil or natural gas; or

(c) For storage of hydrocarbons that are liquid at standard temperature and pressure.

(3) "Class III injection well" means a well used for

extraction of minerals. All Class III wells are prohibited in Washington and must be decommissioned. Examples of Class III injection wells include, but are not limited to, the injection of fluids for:

(a) In situ production of uranium or other metals that have not been conventionally mined;

(b) Mining of sulfur by Frasch process; or

(c) Solution mining of salts or potash.

(4) "Class IV injection well" means a well used to inject dangerous or radioactive waste into or above an underground source of drinking water. Class IV wells are prohibited and must be decommissioned except for Class IV wells reinjecting treated ground water into the same formation from where it was drawn as part of a removal or remedial action if such injection is approved by EPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act or the Resource Conservation and Recovery Act, 40 CFR 144.13(c). Other examples of Class IV wells include:

(a) Dangerous or radioactive waste into or above a formation that contains an underground source of drinking water within one quarter mile of the well. This includes disposal of dangerous waste into a septic system or cesspool regardless of the size; or

(b) Dangerous or radioactive waste that cannot be classified as a Class I well type or (a) of this subsection.

(5) "Class V injection well" means all injection wells not included in Classes I, II, III, or IV. Class V wells are usually shallow injection wells that inject fluids above the uppermost ground water aquifer. Some examples are dry wells, French drains used to manage storm water and drain fields.

(a) The following are examples of Class V injection wells that are allowed in Washington:

(i) Drainage wells used to drain surface fluids, primarily storm water runoff, into or below the ground surface, such as, but not limited to, a drywell or infiltration trench containing perforated pipe;

(ii) Heat pump or cooling water return flow wells used to inject water previously used for heating or cooling;

(iii) Aquifer recharge wells used to replenish the water in an aquifer;

(iv) Salt water intrusion barrier wells used to inject water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water;

(v) Septic systems serving multiple residences or nonresidential establishments that receive only sanitary waste and serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day;

(vi) Subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a nonoil or gas producing zone to reduce or eliminate subsidence associated with the removal of fresh water;

(vii) Injection wells associated with the recovery of geothermal energy for heating, aquaculture and production of

electric power;

(viii) Injection wells used in experimental technologies;

(ix) Injection wells used for in situ recovery of lignite, coal, tar sands, and oil shale;

(x) Injection wells used for remediation wells receiving fluids intended to clean up, treat or prevent subsurface contamination;

(xi) Injection wells used to inject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts;

(xii) Injection wells used to control flooding of residential basements;

(xiii) Injection wells used for testing geologic reservoir properties for potential underground storage of natural gas or oil in geologic formations; if the injected water used is of equivalent or better quality than the ground water in the targeted geologic formation and the ground water in the targeted geologic formation is nonpotable and/or toxic because of naturally occurring ground water chemistry; ((~~and~~))

(xiv) Injection wells used as part of a reclaimed water project as allowed under a permit; and

(xv) Injection wells used to inject carbon dioxide for geologic sequestration.

(b) The following are examples of Class V wells that are prohibited in Washington:

(i) New and existing cesspools including multiple dwelling, community or regional cesspools, or other devices that receive sanitary wastes that have an open bottom and may have perforated sides that serve twenty or more people per day or an equivalent design capacity of 3,500 gallons or larger per day. The UIC requirements do not apply to single family residential cesspools or to nonresidential cesspools which receive solely sanitary waste and have the capacity to serve fewer than twenty persons a day or an equivalent design capacity of less than 3,500 gallons per day;

(ii) Motor vehicle waste disposal wells that receive or have received fluids from vehicular repair or maintenance activities (see definition of motor vehicle waste disposal wells in WAC 173-218-030). UIC wells receiving storm water located at vehicular repair, maintenance or dismantling facilities shall not be considered waste disposal wells if the wells are protected from receiving vehicle waste;

(iii) Wells used for solution mining of conventional mines such as stopes leaching;

(iv) Backfill wells used to inject a mixture of water and sand, mill tailings or other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not;

(v) UIC wells receiving fluids containing hazardous substances (see definition for hazardous substances in WAC 173-218-030) except for wells:

(A) Allowed under (a)(x) of this subsection; or

(B) Receiving storm water that meets the nonendangerment

standard by applying the best management practices and requirements in WAC 173-218-090 or storm water authorized under a permit; and

(vi) UIC wells receiving industrial wastewater except for industrial wastewater authorized under a permit.

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WAC 173-218-090 Specific requirements for Class V wells to meet the nonendangerment standard. Specific requirements for Class V wells are organized by wells that are used for storm water management and wells that are used for other purposes. This section does not apply to the Class V wells in WAC 173-218-100.

(1) **New** Class V UIC wells used for **storm water management** must:

(a) Meet additional ground water protection area requirements as determined by other state laws or by local ordinances;

(b) Not directly discharge into ground water. A separation between the bottom of the well and the top of the ground water is required. The treatment capacity of the unsaturated zone or the zone where the fluid is discharged, and the pollutant loading of the discharge must be considered when determining the vertical separation; and

(c) The owner or operator of a new Class V well used to manage storm water must meet the nonendangerment standard as defined under WAC 173-218-080. The owner or operator of a new Class V well must show compliance with the nonendangerment standard prior to placing a new well into service. Compliance with the nonendangerment standard may be met through one or a combination of the following two approaches:

(i) Presumptive approach: The presumptive approach means compliance with the nonendangerment standard is presumed, unless discharge monitoring data or other site specific information shows that a discharge causes or contributes to a violation of chapter 173-200 WAC Water quality standards for ground waters of the state of Washington, when:

(A) The well activity is in compliance with this chapter; and either

(B) The well is designed and installed to the storm water manual current at the time of construction and is operated in conformance with storm water best management practices including the proper selection, implementation, and maintenance of all on-site pollution control using the current storm water manual published by the department for your region or an equivalent department approved local manual.

(C) Owners or operators of municipal separate storm sewer systems regulated under section 1342(p) of the Federal Water Pollution Control Act which also own or operate Class V UIC wells

may satisfy the presumptive approach by applying the storm water management programs developed to comply with the Federal Water Pollution Control Act to their new UIC wells. For new UIC wells, construction phase and postconstruction storm water controls must be applied in accordance with applicable storm water manuals.

(D) The presumptive approach may not be used when best management practices do not exist to remove or reduce a contaminant, the vadose zone has no treatment capacity and/or the storm water quality is such that a best management practice does not exist to reduce or eliminate the concentration.

(ii) Demonstrative approach: The demonstrative approach means that the technical bases for the selection of storm water best management practices are documented. The documentation must include:

(A) The method and reasons for choosing the storm water best management practices selected;

(B) The pollutant removal performance expected from the practices selected;

(C) The technical basis supporting the performance claims for the practices selected, including any available existing data concerning field performance of the practices selected;

(D) An assessment of how the selected practices will satisfy the requirements of WAC 173-218-080 and chapter 173-200 WAC; and

(E) An assessment of how the selected practices will satisfy state requirements to use all known, available, and reasonable methods of prevention, control and treatment.

(2) **Existing** Class V UIC wells used for **storm water management** do not have to meet the new well requirements. If the UIC wells are not already registered, the owner or operator must register the wells with the department and complete a well assessment. The following timelines must be met unless otherwise approved from the department:

(a) If you own or operate less than or equal to fifty wells:

(i) You have three years after the adoption date of this rule to register your UIC wells unless an extension has been approved by the department;

(ii) You have five years after the adoption date of this rule to complete a well assessment. The approach to conducting the well assessment will be determined by the owner. The well assessment evaluates the potential risks to ground water from the use of UIC wells and includes information such as the land use around the well which may affect the quality of the discharge and whether the UIC well is located in a ground water protection area. It may include the local geology, and depth of the ground water in relation to the UIC well if the well is considered a high threat to ground water. The well assessment requirements will be met if an owner or operator applies the storm water best management practices contained in a guidance document approved by the department to their UIC wells and determines if the UIC well is located in a ground water protection area;

(iii) Any well assessment that identifies a well as a high threat to ground water must include a retrofit schedule; and

(iv) You must immediately take action to correct the use of a well that is determined to be an imminent public health hazard, for example when a drinking water supply is contaminated and causes a public health emergency. The department must be notified within thirty days from the determination and may determine a retrofit schedule. The department's enforcement procedure (see WAC 173-218-130) will be followed when a retrofit schedule is needed.

(b) If you own or operate more than fifty wells:

(i) You have five years after the adoption date of this rule to register your UIC wells unless an extension has been approved from the department;

(ii) You have seven years after the adoption date of this rule to complete a well assessment. The approach to conducting the well assessment will be determined by the owner. The well assessment evaluates the potential risks to ground water from the use of UIC wells and includes information such as the land use around the well which may affect the quality of the discharge, and whether the UIC well is located in a ground water protection area. It may include the local geology, and depth of the ground water in relation to the UIC well if the well is considered a high threat to ground water. The well assessment requirements will be met if an owner or operator applies the storm water best management practices contained in a guidance document approved by the department to their UIC wells and determines if the UIC well is located in a ground water protection area;

(iii) Any well assessment that identifies a well as a high threat to ground water must include a retrofit schedule; and

(iv) You must immediately take action to correct the use of a well that is determined to be an imminent public health hazard, for example when a drinking water supply is contaminated and causes a public health emergency. The department must be notified within thirty days from the determination and may establish a retrofit schedule. The department's enforcement procedure will be followed when a retrofit schedule is needed.

(c) If you own or operate a site that uses, stores, loads, or treats hazardous substances or is an industrial facility that has a Standard Industrial Classification as regulated by Federal Regulations, 40 CFR Subpart 122.26(b)(14) (excluding construction sites), you may use the following to satisfy the documentation requirements for meeting the nonendangerment standard:

(i) If the facility has or will have a waste water discharge permit issued pursuant to chapter 90.48 RCW, including a National Pollutant Discharge Elimination System (NPDES) permit, the associated storm water pollution prevention plan may be used in place of the well assessment to meet the nonendangerment standard provided the storm water pollution prevention plan specifically addresses storm water discharges to UIC wells; or

(ii) For unpermitted facilities, the preparation and implementation of a storm water pollution prevention plan can be used in place of the well assessment to meet the nonendangerment standard if applied to the UIC wells or documentation must be provided to show that the well does not pose a threat to ground

water. Examples of documentation include, but are not limited to, a site drainage map for the UIC wells or a no-exposure certification form completed for discharges to ground.

(d) Owners or operators of municipal separate storm sewer systems regulated under section 1342(p) of the federal Water Pollution Control Act which also own or operate Class V UIC wells may satisfy the nonendangerment standard by applying the storm water management programs developed to comply with the federal Water Pollution Control Act to their UIC wells. For existing UIC wells receiving new sources of storm water, construction phase and post-construction storm water controls must be applied to all development and redevelopment projects in accordance with applicable storm water manuals.

(3) Class V UIC wells **not** used for **storm water management:**

(a) **New** UIC wells that are **not** used for storm water management must:

(i) Not directly discharge into an aquifer, except for wells listed in WAC 173-218-040 (5)(a)(ii) through (iv), (vii) through (xi), (xiii) ((~~and~~)), (xiv) and (xv). A separation between the bottom of the well and the top of the aquifer is required; and

(ii) Meet additional ground water protection requirements if the UIC well is located in a ground water protection area (see WAC 173-218-030) as determined by other state laws or by local ordinances.

(b) **Existing registered** UIC wells that are **not** used for storm water management are already considered to be rule authorized. To verify that current site practices are protective of ground water quality, the owner or operator must complete a survey from the department except for UIC wells used at CERCLA sites. The department will provide written notification that the current site practices are adequate.

(c) **Existing** UIC wells that are **not registered** and **not** used for storm water management must meet the requirements for new wells.

NEW SECTION

WAC 173-218-115 Specific requirements for Class V wells used to inject carbon dioxide for permanent geologic sequestration. (1) **Permit required:**

(a) Class V UIC wells used for the geologic sequestration of carbon dioxide are not rule authorized and must obtain a state waste discharge permit under chapter 173-216 WAC, State waste discharge permit program or chapter 173-226 WAC, Waste discharge general permit program.

(b) Class V injection wells used for the geologic sequestration of carbon dioxide may directly discharge into an aquifer only if:

(i) The aquifer contains "naturally nonpotable ground water" as defined in WAC 173-200-020(18) and is beneath the lowermost formation containing potable ground water within the vicinity of the geologic sequestration project area;

(ii) The operator has obtained a permit under the state waste discharge permit program or the waste discharge general permit program establishing enforcement limits which may exceed the ground water quality criteria, as allowed under WAC 173-200-050 (3)(b)(vi);

(iii) The operator uses all known, available and reasonable methods of prevention, control and treatment (AKART) to remove contaminants, such as sulfur compounds and other contaminants, from the injected CO_2. Geologic sequestration of carbon dioxide shall not be used for the disposal of non-CO_2 contaminants that can be removed with known treatment technologies; and

(iv) The operator is in compliance with all conditions of their state waste discharge permit or their waste discharge general permit.

(2) **Permit application:** A licensed geologist or engineer shall conduct the geologic and hydrogeologic evaluations required under this section. Technical evaluations shall reflect the best available scientific data as well as existing geologic, geophysical, geomechanical, geochemical, hydrogeological and engineering data available on the proposed project area. Existing data may be used in evaluations provided their source and chronology is identified and the effects of any subsequent modifications due to natural (seismic or other) or human induced (hydraulic fracturing, drilling or other) events are analyzed. The waste discharge permit application, under chapter 173-216 or 173-226 WAC, for a permit authorizing the geologic sequestration of carbon dioxide shall include information supporting the demonstration required by WAC 173-200-050 (3)(b)(vi) and all of the following:

(a) A description of how the project will address:

(i) All jurisdictional boundaries within ten miles of the geologic sequestration project boundary such as: International borders, state borders, local jurisdictions, tribal land, national parks or state parks;

(ii) Accessibility for operations and monitoring in areas where access is restricted by: Shorelines, flood plains, urban or other development, and any other natural or man-made limiting factors;

(iii) Active Holocene faults within five miles and seismic risks;

(b) A current site map showing:

(i) The boundaries of the geologic sequestration project which shall be calculated to include the area containing ninety-five percent of the injected CO_2 mass one hundred years after the completion of all CO_2 injection or the plume boundary at the point in time when expansion is less than one percent per year, whichever is greater, or another method approved by the department;

(ii) Location and well number of all proposed CO_2 injection

wells;

(iii) Monitoring wells;

(iv) Location of all other wells including cathodic protection boreholes; and

(v) Location of all pertinent surface facilities, including atmospheric monitoring within the boundary of the project;

(c) A technical evaluation of the proposed project, including but not limited to, the following:

(i) The names and lithologic descriptions of the geologic containment system;

(ii) The name, description, and average depth of the reservoir or reservoirs to be used for the geologic containment system;

(iii) A geophysical, geomechanical, geochemical and hydrogeologic evaluation of the geologic containment system, including:

(A) An evaluation of all existing information on all geologic strata overlying the geologic containment system including the immediate caprock containment characteristics as well as those of other caprocks if included in the containment system and all designated subsurface monitoring zones;

(B) Geophysical data and assessments of any regional tectonic activity, local seismicity and regional or local fault zones; and

(C) A comprehensive description of local and regional structural or stratigraphic features;

(iv) The evaluation shall focus on the proposed geologic sequestration reservoir or reservoirs and a description of mechanisms of geologic containment, including but not limited to:

(A) Rock properties;

(B) Regional pressure gradients;

(C) Structural features; and

(D) Absorption characteristics or geochemical reaction/mineralization processes, with regard to the ability to prevent migration of CO_2 beyond the proposed geologic containment system;

(v) The evaluation shall also identify:

(A) Any productive oil and natural gas zones occurring stratigraphically above, below, or within the geologic containment system;

(B) All water-bearing horizons known in the immediate vicinity of the geologic sequestration project;

(C) The evaluation shall include a method to identify unrecorded wells that may be present within the project boundary;

(vi) The evaluation shall include exhibits, plans and maps showing the following:

(A) All wells, including but not limited to, water, oil, and natural gas exploration and development wells, injection wells and other man-made subsurface structures and activities, including any mines, within one mile of the geologic sequestration project;

(B) All man-made surface structures that are intended for temporary or permanent human occupancy within one mile of the geologic sequestration project;

(C) Any regional or local faulting within the boundary of the

geologic sequestration project;

(D) An isopach map of the proposed CO_2 storage reservoir or reservoirs that make up the geologic containment system;

(E) An isopach map of the primary and any secondary caprock or containment barrier;

(F) A structure map of the top and base of the storage reservoir or reservoirs that make up the geologic containment system;

(G) Identification of all structural spill points or stratigraphic discontinuities controlling the isolation of CO_2 or associated fluids;

(H) An evaluation of the potential displacement of in situ water and the potential impact on ground water resources, if any; and

(I) Structural and stratigraphic cross-sections that describe the geologic conditions at the geologic containment system;

(vii) An operations and maintenance plan including, but not limited to, a diagram of the entire injection system and a description of the proposed operating and maintenance procedures;

(viii) A review of the data of public record for all wells within the geologic sequestration project area which penetrate the geologic containment system including the primary and/or all other caprocks and those wells that penetrate these geologic layers within one mile of the boundary of the geologic sequestration project area, or any other distance deemed necessary by the department. This review shall determine if all abandoned wells have been plugged in a manner that prevents the movement of CO_2 or associated native fluids away from the geologic containment system;

(ix) The proposed maximum bottom hole injection rate and injection pressure to be used at the geologic containment system. The maximum allowed injection pressure shall be no greater than eighty percent of the formation fracture pressure as determined by a mini-frac injection test or multiple-stage, minimum threshold fracture injection test or other method approved by the department. The geologic containment system shall not be subjected to injection pressures in excess of the calculated fracture pressure even for short periods of time. Higher operating pressures may only be allowed if approved in writing by the department;

(x) The proposed maximum long-term geologic containment system pressure and the necessary technical data to support the proposed geologic containment system storage pressure request;

(xi) The evaluation and data quality shall be sufficient to establish with a high degree of confidence that the geologic containment system has sufficient capacity, injectivity and other geologic characteristics to permanently sequester CO_2 for the lifetime of the project;

(d) The predicted extent of the injected CO_2 plume throughout the life of the project, determined with established modeling tools that use all available geologic and reservoir engineering information, and the projected response and storage capacity of the geologic containment system. The assumptions used in the model and a discussion of the uncertainty associated with the estimate shall

be clearly presented;

(e) An analysis and selection of proposed treatment technology for non-CO_2 contaminant that identifies the technology which meets the requirement that all known, available and reasonable methods of prevention, control and treatment (AKART) to remove contaminants from the injected CO_2;

(f) A detailed description of the proposed project public safety and emergency response plan. The plan shall detail the safety procedures concerning the facility and residential, commercial, and public land use within one mile, or any other distance as deemed necessary by the department, of the boundary of geologic sequestration project area. The public safety and emergency response procedures shall include contingency plans for leakage from any well, flow lines, or other permitted facility. The public safety and emergency response procedures also shall identify specific contractors and equipment vendors capable of providing necessary services and equipment to respond to incidents such as: Injection well leaks or loss of containment from injection wells or releases from the geologic containment system. These emergency response procedures shall be updated as necessary throughout the operational life of the permitted storage facilities;

(g) A detailed worker safety plan that addresses safety training and safe working procedures at the facility;

(h) A corrosion monitoring and prevention plan for all wells and surface facilities;

(i) A leak detection and monitoring plan for all wells and surface facilities. The approved leak detection and monitoring plan shall define the threshold for determining that a leak has occurred and shall address:

(i) Identification of any failure of the containment system;

(ii) Identification of release to the atmosphere;

(iii) Identification of degradation of any ground water or surface water resources; and

(iv) Identification of migration of CO_2 or other contaminants into any overlying oil and natural gas reservoirs;

(j) A geologic sequestration project leak detection and monitoring plan using subsurface measurements to monitor movement of the CO_2 plume both within and to detect migration outside of the permitted geologic containment system. This must include:

(i) Collection of baseline information on formation pressure and background concentrations in ground water, surface soils, and chemical composition of in situ waters within the geologic containment system and monitoring zone(s);

(ii) Monitoring of pressure responses and other appropriate information immediately above caprock of the geologic containment system;

(k) The approved subsurface leak detection and monitoring plan shall be based on the site-specific characteristics as documented by materials submitted in the permit application and shall address:

(i) Identification of any failure in the containment system;

(ii) Identification of release to the atmosphere;

(iii) Identification of degradation of any ground or surface water resources; and

(iv) Identification of migration of CO_2 or other contaminants into any overlying oil and natural gas reservoirs;

(l) A risk assessment that identifies and quantifies hazards, probabilities, features, events and processes that might result in undesirable impacts to public health and the environment;

(m) A mitigation and remediation plan that identifies trigger thresholds and corrective actions to be taken prior to a containment system failure, if ground water quality in the monitoring zone or above is degraded, or if carbon dioxide is released to the atmosphere. The mitigation and remediation plan must be approved by the department before injection begins;

(n) The proposed well casing, cementing and integrity testing program;

(o) A closure and post-closure plan, including a closure and post-closure cost estimate;

(p) The application shall designate a financial assurance mechanism sufficient to cover the cost to the department for the abandonment of the project or remediation of facility leaks should the operator not perform as required or cease to exist;

(q) The application shall designate a financial assurance mechanism sufficient to provide financial assurance to the department to cover the plugging and abandonment or the remediation of a CO_2 injection and/or subsurface observation well should the operator not perform as required in accordance with the permit or cease to exist;

(r) The payment of the application fee; and

(s) Any other information that the department requires.

(3) **Geologic sequestration well standards.** (Note: In statutory references to chapter 344-12 WAC, the word "gas" shall include all injected carbon dioxide for geologic sequestration, including supercritical CO_2.) Wells used for geologic sequestration projects must meet the following:

(a) Casing materials and cement must be designed and tested to withstand the reactive fluids and expected conditions encountered during the lifetime of the geologic sequestration project, including the post-closure period.

(b) Minimum standards for construction and maintenance of wells. Chapter 173-160 WAC.

(c) Drilling fluid standards of WAC 344-12-098.

(d) Directional or other appropriate surveys shall be completed for all wells to verify location at depth.

(e) Wells must be logged with appropriate geophysical methods which include at a minimum: Cement bonding and evaluation logs, and casing inspection logs. In addition a standard suite of "state of the art" wireline logs shall be run on each well to document physical properties of the well, the well integrity and any potential leakage points. At a minimum the wireline logging suite must include: Gamma ray, resistivity, temperature, formation pressure, both p- and v-sonic and neutron-density.

(f) All collected geologic data, including geophysical logs,

geologists logs, mud logs, and drilling logs, core, drill cuttings, and all other logs and surveys shall be submitted to the department of natural resources, division of geology and earth resources within thirty days after well completion. Submitted information shall include one paper and one digital copy of logs. (Note: The department of natural resources maintains geologic records in the state to enhance the scientific, economic and environmental values of the people of the state.)

(g) One paper and one digital copy of all reports and data collected from surface geological and geophysical surveys of sequestration sites shall be submitted to the department of natural resources, division of geology and earth resources within thirty days after completion.

(h) Wells that are completed within or below the geologic containment system must in addition:

(i) Meet the well casing and cementing standards of WAC 344-12-087;

(ii) Verify the integrity of cement behind casings, including the location of any channels, contamination or missing cement, by a cement map that incorporates data from a cement bond log, a variable density display, and an ultrasonic image, unless an alternative evaluation has been approved in writing by the department;

(iii) Meet the blowout prevention standards of WAC 344-12-092;

(iv) Wells shall be periodically tested to assess their structural integrity. Annual tests shall include wireline surveys for casing integrity/corrosion assessment and other appropriate tests. An injection well casing pressure test will be conducted prior to use and retested at least once prior to each permit renewal or when casing integrity/corrosion assessments identify risks. Any finding of inadequate structural integrity shall be reported to the department within twenty-four hours.

(i) Notify the department thirty days prior to beginning any substantial work on wells including, deepening, repair or closure. Advance notice period may be reduced by the department when the work is intended to address immediate threats to public health, safety or the environment.

(4) **Permit terms and conditions.** All terms and conditions listed in WAC 173-216-110, state waste discharge permit program, apply. In addition, the following terms and conditions shall apply to injection permits for the geologic sequestration of carbon dioxide:

(a) To be issued a permit, an applicant must demonstrate the following:

(i) That the geology, including geochemistry, of the site will:

(A) Provide "permanent sequestration" of carbon dioxide as defined by WAC 173-407-110; and

(B) The caprock and other features of the geologic containment system have the appropriate characteristics to prevent migration of carbon dioxide, other contaminants and nonpotable water.

(ii) A monitoring program has been developed to identify

leakage from the geologic containment system to the atmosphere, surface water and ground water. The monitoring program must be able to identify ground water quality degradation in aquifers prior to degradation of any potable aquifer. The monitoring program shall include observations in the monitoring zone(s) that can identify migration to aquifers as close stratigraphically to the geologic containment system as practicable.

(iii) Design and construction standards of all facility structures and wells are sufficient to prevent migration of carbon dioxide or nonpotable water that will degrade water quality or impact beneficial uses outside the geologic containment system.

(iv) All known, available and reasonable methods of prevention, control and treatment (AKART) will be used to remove contaminants from the injected CO_2. Geologic sequestration of carbon dioxide shall not be used for the disposal of non-CO_2 contaminants that can be removed with known treatment technologies.

(b) Pilot studies at potential geologic sequestrations projects sites shall be encouraged to collect site characterization, risk assessment and feasibility information. Permits for pilot studies may be issued without meeting all the Class V geologic sequestration project requirements only when:

(i) The pilot study is for a limited time duration;

(ii) Public health and the environment are protected;

(iii) The pilot study will collect detailed site-specific information used to establish the feasibility of permanent sequestration in developing a permit application that meets the standards of this section. The pilot study permit shall be based upon an operator submitted pilot study plan that addresses:

(A) Site-specific geologic information including reasons for selecting a site as a potential geologic sequestration project;

(B) Site-specific hydrogeologic information that includes information on potable aquifers and how their water quality will be protected;

(C) A detailed plan of work for the pilot study that includes monitoring and quarterly reporting;

(D) The information to be gained by the study;

(E) The total quantity of CO_2 to be injected and an estimated injection schedule for the study. CO_2 injections for pilot studies shall be limited to no more than 1,000 metric tons CO_2, unless the operator demonstrates in the plan that a larger quantity is necessary to determine the feasibility and risks of a project;

(F) The procedures to be implemented to protect public health and the environment;

(iv) Pilot study permits shall not be used for a full scale carbon sequestration project. Injection of carbon dioxide associated with a pilot study permit shall be of limited quantity and duration, not to exceed five years.

(c) The permit shall include a maximum working pressure in the geologic containment system, calculated from information provided in the application, that assures that the pressure in the injection zone does not initiate new fractures or propagate existing fractures in the injection zone or caprock. In no case shall the

injection pressure initiate fractures in the caprock or cause the movement of injected fluids or formation fluids into shallower aquifers. Controlled artificial fracturing of the injection zone of the geologic containment system may be allowed with a plan that has been approved by the department.

(d) If the operator identifies leakage in excess of the thresholds established in the mitigation and remediation plan, water quality degradation in shallower aquifers or leaks to the surface, including those around wells or within well casing, the operator must:

(i) Notify the department within twenty-four hours;

(ii) Take all necessary actions to protect public health, safety and the environment;

(iii) Stop injecting immediately, until the project obtains approval for redefining the geologic containment system and its relevant dimensions by the department;

(iv) Implement the mitigation and remediation plan to arrest and reverse environmental impacts. Amendments to the mitigation plan shall be developed in consultation with the department;

(e) Monitoring for geologic sequestration projects shall include:

(i) Characterization of injected fluids;

(ii) Continuous recording of injection pressure, flow rate and volume;

(iii) Continuous recording of pressure on annulus between tubing and long string casing;

(iv) Monitoring zone leak detection identified in (a)(ii) of this subsection;

(v) Sufficient monitoring to confirm the spatial distribution of the CO_2 in the subsurface.

(f) Quarterly reports shall be submitted to the department that include the following:

(i) Physical, chemical and other relevant characterization of the injected fluids;

(ii) Monthly average, maximum and minimum values for injection pressure, flow rate, volume injected and annular pressure;

(iii) Updated data for modeling that will project and/or establish the spatial distribution of CO_2 in the subsurface;

(iv) Results from monitoring zone leak detection;

(v) Results from any other tests/work completed during the reporting period, such as mechanical integrity tests, geophysical surveys, acoustic monitoring, well repairs, etc.

(g) Annual reports shall be submitted to the department that include:

(i) A summary of the data collected throughout the year, including any trends, observations, predictions as well as calculated spatial distribution of injected CO_2;

(ii) List of all noncompliance with the permit along with an explanation of the cause(s) and subsequent remedial measures taken;

(iii) Updated modeling based on the monitoring observations and measurements including a summary of calculated spatial distribution of CO_2 and all other conditions in the subsurface

necessary to establish the effectiveness of the geologic containment system, as well as a discussion of history matching and an assessment of the model's accuracy to date. Updated projections of project response and capacity based on operational experience, including all new geologic data and information;

(iv) Observed anomalies from predicted behavior shall be identified and explained;

(v) Discussion of suggested changes in project management or suggested amendment of permit conditions;

(vi) A report on the financial assurance account which includes updated calculation of cost estimates for all closure and post closure activities and documentation that the account is adequately funded to cover the calculated cost.

(5) **Closure.** If all of the project's carbon dioxide injections are interrupted for a period of one hundred eighty consecutive days, the operator shall begin implementing the approved closure plan. Injection project management may include injection and resting periods possibly exceeding one hundred eighty days for individual injection wells. The closure triggers are for the entire injection facility not individual wells. The department may extend this one hundred eighty day period, in writing, upon the request of the operator, if the operator demonstrates that carbon dioxide injection will resume within a period of not more than two years. The operator shall review and amend the closure plan as needed, at a minimum the plan shall be reviewed at each permit renewal. Proposed amendments shall be effective only after approved in writing by the department. Approval of proposed amendments shall not delay the commencement of closure activities using the most recent approved closure plan. If the operator fails to begin closure, or is not able to begin closure, the department shall use the financial assurance account to begin closure activities.

(6) **Post-closure activities.** The operator is obligated to renew and be covered under permit and pay all appropriate permit fees throughout the post-closure period. The operator shall continue all required monitoring and reporting throughout the closure and post-closure period. The operator shall review and amend the post-closure plan as needed, at a minimum the plan shall be reviewed at each permit renewal. The post-closure period shall continue until the department determines that modeling and monitoring demonstrate that conditions in the geologic containment system indicate that there is little or no risk of future environmental impacts and there is high confidence in the effectiveness of the containment system and related trapping mechanisms. The post-closure period shall be complete only after the operator has received written approval from the department. If the operator fails to or is not able to continue the post-closure activities as required, the department shall use the financial assurance account to complete post-closure activities. Any funds remaining in the financial assurance account shall be released to the operator upon the department's approval of the completion of the post-closure period.

(7) **Financial assurance.**

(a) The owner or operator shall establish a closure and post-closure account to cover all closure and post-closure expenses. The performance security held in the account may be:

(i) Bank letters of credit;

(ii) Cash deposits;

(iii) Negotiable securities;

(iv) An assignment of savings account;

(v) A savings certificate in a Washington bank; or

(vi) A corporate surety bond executed in favor of the department by a corporation authorized to do business in the state of Washington.

(b) The department may for any reason refuse any performance security not deemed adequate.

(c) The cost of the closure and post-closure activities shall be calculated using current cost of hiring a third party to close all existing facilities and to provide post-closure care, including monitoring identified in the closure and post-closure plan.

(d) The closure and post-closure cost estimate shall be revised annually to include any changes in the facility and to include cost changes due to inflation.

(e) The obligation to maintain the account for closure and post-closure care survives the termination of any permits and the cessation of injection. The requirement to maintain the closure and post-closure account is enforceable regardless of whether the requirement is a specific condition of the permit.

(8) **Mitigation and remediation.** Each project must develop a mitigation and remediation plan that identifies trigger thresholds and corrective actions to be taken if the containment system fails, if water quality outside the geologic containment system is degraded, if carbon dioxide is released to the atmosphere or if any other factor poses an unacceptable risk to public health or the environment. A mitigation and remediation plan must be approved by the department before injection begins and amended as needed. The operator shall review and amend the mitigation and remediation plan as needed, at a minimum the plan shall be thoroughly reviewed at each permit renewal. The mitigation and remediation plan shall:

(a) Define leakage (i.e., trigger threshold), leak detection and identification;

(b) Address caprock and spill-point leaks;

(c) Address well bore leaks from project wells or previously unidentified wells;

(d) Identify immediate responses to protect public health, safety and the environment;

(e) Provide a detailed list of notifications and surveys;

(f) Address remedial measures such as: Well repairs, reduced injection pressure, reservoir or formation pressure, creation of a pressure barrier through increased pressure above geologic containment system, interception, recovery and reinjection of CO_2 or the removal of injected materials;

(g) Address redefining the geologic containment system or closure and abandonment of the sequestration project.